performs a pumping stroke, fuel pressure within the pumping chamber **626** is increased, causing the accumulator volume **606** to be filled with high pressure fuel so that the system is returned to its initial state as shown in **FIG. 7***a*.

[**0060**] If necessary, an injection of fuel can occur during the filling process by opening the needle control valve **202**. The system therefore provides the further advantage that injection can be effected during any stage of the full cycle.

[**0061**] An example of an idealised injection boot profile appropriate for the booster fuel injection system **600** is shown in **FIG. 8** (see dotted line), where it is contrasted with the example from **FIG. 1***b* for the prior art fuel injection system **400** (see solid line).

[**0062**] It will be appreciated that for main injections commencing with an identical toe section, the second parts of the injection profile achievable by the two contrasting fuel injection systems are radically different. The booster fuel injection system **600** allows greater peak injection pressures to be achieved than in the fuel injection system **400**. Furthermore, these peaks can be achieved more rapidly by the booster fuel injection system **600**. In turn this means that, for a given injector, fuel is injected at a greater rate and so injection events can be completed more quickly. It is a further benefit that synchronicity between the injector and the engine is improved, such that the timing of the injection can be targeted to coincide with optimum conditions within the engine. In summary, the booster fuel injection system **600** facilitates greater variation of injection profile characteristics which will aid minimising engine emissions.

[**0063**] Having described a particular preferred embodiment of the present invention, it is to be appreciated that the embodiment in question is exemplary only, and that variations and modifications, such as those that will occur to those possessed of the appropriate knowledge and skills, may be made without departure from the scope of the invention as set forth in the appended claims. For example, it will be appreciated that it need not be a surface of the valve needle **204** itself that is exposed to fuel pressure within the control chamber **210**, rather it could be an associated surface, for example an extension piece of the valve needle **204**. Additionally, the control chamber **210**, and hence the valve needle spring **212**, may be located remotely from the valve needle **204** itself, whilst still providing the required closing force to seat the valve needle **204** to terminate injection. A further design option is to locate the spring **212** elsewhere, and not within the control chamber **212**. Further alternative variations in injector design will be apparent to those familiar with this technical field.

[**0064**] Of course, any of the valves described previously may preferably, but need not, be electrically or electromagnetically operated by energisation or de-energisation of an electromagnetic actuator winding. It will further be appreciated that references to "actuation of a valve" to cause a valve to move between its operating positions may, for an electromagnetically operable valve, be implemented either by increasing the energisation level of the actuator winding or by decreasing the energisation of the winding to cause said movement. Other forms of valve actuation means would, however, be envisaged by those skilled in the art, both hydraulic and/or mechanical, whilst still achieving the required valve functions.

[**0065**] It will also be apparent that the electronic engine controller will operate in accordance with look-up tables or data maps containing pre-stored information. The implementation of look-up tables and data maps for engine fuelling purposes would be familiar to a person skilled in this technical field.

[**0066**] With regard to the rail pressure fuel supply **602**, it will be apparent to those skilled in the art that an accumulator volume which is supplied by an external feed could be employed. In this embodiment the system re-filling process described with respect to **FIG. 7***f* is no longer required.

[**0067**] It will further be appreciated that the shut off valve **618** may be configured differently, whilst still enabling the advantages of the invention to be achieved, and that the specific structure of the shut off valve **618** described previously is only one example of a suitable valve construction that may be used. For example, the control surface of the shut of valve member **628**, being the surface exposed to fuel within the chamber **633** in the embodiment described, may be arranged at one end of the shut off valve member **28** instead.

1. A fuel injection system for supplying pressurised fuel to a fuel injector (**200**), the fuel injection system comprising:

an accumulator volume (**606**) for supplying fuel at rail pressure (P**1**) to the fuel injector (**200**) through a rail fuel supply passage (**608**);

a fuel pressurising arrangement (**604**) for supplying fuel at a selected pressure (P**2**) greater than rail pressure (P**1**) to the fuel injector (**200**) through a pressurised fuel supply passage (**614**); and

a fuel shut-off valve (**618**) operable during an injection of fuel from the rail fuel supply passage (**608**) between a closed position in which fuel is retained within the pressurising arrangement (**604**) and an open position in which pressurised fuel is supplied to the injector (**200**) from the pressurising arrangement (**604**), thereby to provide a boost in the fuel pressure delivered during an injection event.

2. A system according to claim 1, wherein the rail fuel supply passage (**608**) and the pressurised fuel supply passage (**614**) communicate with a delivery chamber (**207**) of the injector (**200**).

3. A system according to claim 1, wherein the rail fuel supply passage (**608**) includes a non-return valve (**609**) which serves to prevent a back flow of fuel at the selected pressure greater than rail pressure (P**2**) to the accumulator volume (**606**).

4. A system according to claim 1, further comprising a rail control valve (**612**) operable between an open position in which fuel from the accumulator volume (**606**) is permitted to flow into the fuel pressurising arrangement (**604**) and a closed position in which fuel in the fuel pressurising arrangement (**604**) is isolated from the fuel within the accumulator volume (**606**).

5. A system according to claim 4, wherein the rail fuel supply passage (**608**) includes a rail supply junction (**610**) via which fuel within the accumulator volume (**606**) is supplied to the fuel pressurising arrangement (**604**).

6. A system according to claim 5, wherein the rail control valve (**612**) is located between the rail supply junction (**610**) and the fuel pressurising arrangement (**604**).

7. A system according to claim 5, including a control arrangement adapted to: